

APPLICANT(S): BARTLETT, Philip Nigel et al.

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REMARKS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Applicants assert that the present invention is new, non-obvious and useful. Prompt consideration and allowance of the claims is respectfully requested.

Status of Claims

Claims 1-17 are pending in this application and have been rejected.

Claims 1, 4-7, 9, 15 and 16 have been amended herein. Applicants respectfully assert that the amendments to the claims add no new matter.

CLAIM REJECTIONS

35 U.S.C. § 112 Rejections

In the Office Action, the Examiner rejected claims 2-9 and 11-17 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner stated that the limitation "said mesoporous structure" in claims 11, 13 and 15 lacks antecedent basis, and that the limitation "the pores" in claims 6, 15 and 16 is unclear.

In response, Applicants have amended claims 1, 4-7, 9, 15 and 16 in order to overcome the deficiencies noted by the Examiner by correcting the references to the mesoporous structure or the pores of the cathode or of the anode or both. It is respectfully asserted that the foregoing amendments merely address matters of form and do not change the literal scope of the claim in any way or result in any prosecution history estoppel.

Applicants respectfully assert that these amendments render claims 2-9 and 11-17 proper under 35 USC § 112, second paragraph.

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35 U.S.C. § 103 Rejections

In the Office Action, the Examiner rejected claims 1-17 under 35 U.S.C. § 103(a), as being unpatentable over Sakamoto et al. (U.S. Pat. 6,153,334) in view of Ebihara et al. (U.S. Pat. 6,331,367). Applicants respectfully traverse this rejection.

The present invention relates to an electrochemical cell in which both the cathode and the anode are composed of mesoporous material (i.e., have a mesoporous structure) having a periodic arrangement of substantially uniformly sized pores. As is clearly explained in the specification, these structures are materials that have been produced by a liquid crystal templating process, that are monolithic in nature, and that contain a long-range, regular arrangement of pores having defined topology and substantially uniform pore size, i.e., they are films deposited from a liquid crystal template. The limitation “periodic arrangement of substantially uniformly sized pores” of both electrodes in claim 1 makes it very clear that the mesoporous materials/structures of the electrodes are of this type.

The Examiner alleges that Sakamoto discloses a cathode comprising “mesoporous nickel hydroxide having a periodic arrangement of substantially uniformly sized pores of cross-section 40 Å”, citing column 5, lines 34-49. However, Applicants point out that Sakamoto contains no disclosure whatsoever of a “periodic arrangement of substantially uniformly sized pores”. This is because Sakamoto relates to a completely different type of material -- instead of the film-type materials according to the present invention, Sakamoto's materials are particulate and the porosity results from “grain boundaries between crystals” (col. 5, lines 41-42 and Fig. 2b). The particles themselves are solid. This is in complete contrast to the materials of the present invention, in which the porosity is built into the materials themselves (they are monolithic structures lacking grain boundaries). The final paragraph of page 2 of the specification sets out the advantages of the arrangement of the present invention compared to the nanomaterial-type arrangement disclosed by Sakamoto.

According to the above, it is clear that Sakamoto fails to disclose a structure having a periodic arrangement of uniformly sized pores, as required by independent claim 1.

Furthermore, claim 1 requires that the cathode comprises mesoporous nickel (optionally with a coating of nickel hydroxide). By contrast, Sakamoto relates to nickel hydroxide, but fails to disclose nickel metal having any kind of porous structure. Thus, for

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this reason as well, Sakamoto clearly does not disclose a cathode material of the type required by Claim 1.

Similarly, Ebihara relates to particulate materials, rather than films deposited from a liquid crystal template, and so also clearly fails to disclose materials having a "periodic arrangement of substantially uniformly sized pores". It should also be noted that the materials of Ebihara are merely porous on the particle surfaces (see Claim 1; col. 2, lines 13-14 and 56-58 of Ebihara), and that the particles are internally solid (hence the low surface area and pore volume values quoted in Ebihara). Finally, the Ebihara particles are non-homogeneous, being nickel-rich at their surfaces. Thus, again, the materials of Ebihara are clearly very different to the monolithic films of the present invention.

Since neither Sakamoto nor Ebihara discloses any materials of the type claimed, namely materials with a mesoporous structure having a periodic arrangement of uniformly sized pores, the combination of Sakamoto and Ebihara do not render there seems to be no possible way to combine these documents to arrive at the present invention. Accordingly, Applicants respectfully assert that independent claim 1 is allowable.

Each of claims 2-17 depends, directly or indirectly, from independent claim 1, and therefore includes all the limitations of that claim. Therefore, Applicants respectfully assert that claims 2-17 are likewise allowable. Accordingly, Applicants respectfully request that this rejection of claims 1-17 be withdrawn.

Conclusion

In view of the foregoing amendments and remarks, Applicants assert that the pending claims are allowable. Their favorable reconsideration and allowance is respectfully requested.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, or if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

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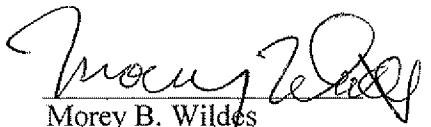
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Respectfully submitted,



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